

Claims

What is claimed is:

1. A valve (1), comprising:
a body (2);
5 a bushing (3) slidably mounted on said body;
a valve spool (4) slidably mounted on said bushing;
said bushing and spool having respective control edges (5) that are adapted to cooperate with one another as a function of the relative position between said bushing and spool to vary the size of a control opening therebetween;
10 a first drive (11) operatively arranged to controllably move one of said bushing and spool relative to said body; and
a second drive (12) operatively arranged to controllably move the other of said bushing and spool relative to said body;
whereby said first and second drives may be selectively operated to move said
15 bushing and spool simultaneously in opposite directions to increase the dynamic response of said valve.
2. A valve as set forth in claim 1 wherein said first drive includes a piezoelectric element (13) or a plunger coil.
3. A valve as set forth in claim 1, and further comprising:
20 a spool position sensing device (6) for sensing the position of said spool relative to said bushing.
4. A valve as set forth in claim 3 wherein said spool position sensing device includes an eddy current sensor (7).
5. A valve as set forth in claim 1, and further comprising:
25 a bushing position sensing device (8) for sensing the position of said bushing

relative to said body.

6. A valve as set forth in claim 5 wherein said bushing position sensing device includes an eddy current sensor, a Hall effect sensor (9), or a linear variable displacement transducer.

5 7. A valve as set forth in claim 1 whereon said first drive is operatively arranged to control the position of said bushing relative to said body, and wherein said second drive is operatively arranged to control the position of said spool relative to said bushing.

8. A valve as set forth in claim 1 wherein one of said first and second drives has a dynamic response greater than the other of said first and second drives.

10 9. A valve as set forth in claim 1 wherein one of said first and second drives has a stroke that is greater than that of the other of said first and second drives.